

REMARKS

Claims 1, 7, 8, 11-15 and 18 are amended, claims 9, 10 and 25 are canceled without prejudice or waiver of patentable subject matter, and no claims are added; as a result, claims 1- 8, 11- 24 and 26 are now pending in this application.

§102 Rejection of the Claims

Claim 1 was rejected under 35 USC § 102(b) as being anticipated by Takemura et al. (U.S. Patent No. 5,666,020). Applicant respectfully traverses this rejection.

The cited reference of Takemura appears to disclose an emitter having the top of the emitter tip having the highest resistance of any other part during conduction (col. 4, lines 45-48 and col. 5, lines 13-16). Takemura states that it is preferred that the emitter has resistance that simply increases in a direction toward the top of the emitter. Applicant respectfully submits that this described structure is not the same as the presently claimed structure, at least in that the cited reference states that the top of the emitter is coated with a third material (col. 5, lines 22-23) and that the emitter is highly resistive except for the top of the emitter, which has a lower resistance (col. 11, lines 18-26 and fig. 6). By comparison, the presently claimed invention includes the features that the recited emitter coating, which is discussed in the specification at least on pages 7, 8 and 10, is embedded in the emitter and covers substantially the entire emitter 401, over the distance labeled 425 in Figures 4B and 4C. Thus, the Takemura structure is different than the claimed structure at least in failing to recite the combination of features of “...*at least one emitter comprising silicon having a coating embedded in the surface of the at least one emitter that releases electrons at a predetermined energy level ...*”, as recited in independent claim 1, as amended herein. Since independent claim 1 has been shown to be patentably distinct over the cited reference, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The dependent claims are seen as patentable at least as depending upon base claims shown above to be patentable over the cited document (Itoh), and further as reciting additional patentable features over the cited reference. Specifically, claim 2 recites that the coating decomposes at least one matter in the outgassing, which clearly the cited document of Itoh does

not, since the cited document teaches gettering to attach oxygen, not to decompose oxygen.

Applicant therefore respectfully requests that this rejection be withdrawn.

§103 Rejection of the Claims

Claims 1-4, 6, 9, 11-15 and 25 were rejected under 35 USC § 103(a) as being unpatentable over Itoh et al. (U.S. Patent No. 5,793,154) in view of Kumar (U.S. Patent No. 5,548,185). Applicant respectfully traverses this rejection. Claims 9 and 25 are cancelled herein without prejudice or waiver of patentable subject matter.

The cited Itoh reference discloses a field emitter having a gate material that acts as a getter to prevent oxygen from forming an oxide on the emitter (Itoh's abstract; col. 2, lines 10-14, 17-20 and 65-67; col. 3, lines 4-10 and 60-63; col. 4, lines 1-3 and 31-36). The outstanding Office Action uses the cited Kumar reference to show the missing feature of the emitter being comprised of silicon.

The cited Itoh reference, whether taken alone or in any combination with the silicon emitter of Kumar, still does not describe or suggest the claimed features of claims 1-4, 6, 9, 11-15, and 25. Applicant can not find where Itoh teaches at least the claimed feature of "*...at least one emitter comprising silicon having a coating embedded in the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating acts in the presence of outgassing to inhibit degradation of the at least one emitter ...*", as recited in claims 1-4, 6, 9, 11-15, and 25, as amended herein. Applicant can find no teaching in Itoh of an emitter that has any predetermined emission energy level, or that is embedded in the emitter. Itoh clearly does not have an emitter coating that acts in the presence of outgassing, but rather discloses that the gate has a surface formed or a material of oxygen bonding strength higher than that of the surface of the emitter (abstract, col. 2, line 18; col. 2, line 65; col. 3, line 61). Thus the Itoh reference discloses using the gate to getter oxygen and does not describe or suggest a coating on the emitter that acts in the presence of outgassing, whether taken alone or in any combination with Kumar. Therefore, since the suggested combination of Itoh with Kumar results in a different arrangement from the claimed structure of claims 1-4, 6, 9, 11-15, and 25, the function is different, and the method of operation is different, then Applicant submits that the suggested

combination of references is inappropriate and the rejection should be reconsidered and withdrawn.

Claim 5 was rejected under 35 USC § 103(a) as being unpatentable over Itoh et al. (U.S. Patent No. 5,793,154) in view of Kumar (U.S. Patent No. 5,548,185) and further in view of Takemura (U.S. Patent No. 5,666,020). Applicant respectfully traverses this rejection.

The features of the cited references of Itoh and Kumar have been discussed above with reference to the prior rejections. The outstanding Office Action uses the Takemura reference to show that the emitter may be a silicide compound. Applicant respectfully disagree and submits that the indicated portion of the Takemura reference discloses (col. 5, lines 22-30) that the “top of the emitter coated with a third material having a third resistivity which is lower than the second resistivity”, and that such an arrangement “lowers the value of the work function associated with the emitter”, and describes and suggested nothing with regard to “...acts in the presence of outgassing to inhibit degradation of the at least one emitter...”, as recited in independent claim 1. Further, Applicant submits that nothing in any of the suggested combination of cited references describes or suggests that the coating is embedded in the emitter.

In view of the about noted differences and deficiencies in the suggested combination of references, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claim 7 was rejected under 35 USC § 103(a) as being unpatentable over Itoh et al. (U.S. Patent No. 5,793,154) in view of Kumar (U.S. Patent No. 5,548,185) and further in view of Pack (U.S. Patent No. 5,921,838). Applicant respectfully traverses this rejection.

The features of the cited references of Itoh and Kumar have been discussed above with reference to the prior rejections. The outstanding Office Action uses the Pack reference to show that a platinum coating is known. Applicant respectfully submits that the suggested combination of references, whether taken alone or in any combination, fails to describe or suggest at least the combination of features of “...at least one emitter comprising silicon having a platinum coating embedded in the surface of the at least one emitter that releases electrons at a predetermined energy level, the platinum coating decomposes at least one matter in the presence of outgassing to inhibit degradation of the at least one emitter, the outgassing including

organic matters ...”, as recited in claim 7, as amended herein. The reasoning is similar to that given above with reference to the rejection of claim 5, specifically that the cited references disclose using the gate as a getter to prevent the emitter from being exposed to degradation and that it is not suggested that the emitter coating decomposes the outgassing material, and that the coating is embedded in the emitter surface.

In view of the about noted differences and deficiencies in the suggested combination of references, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claim 8 was rejected under 35 USC § 103(a) as being unpatentable over Takemura (U.S. Patent No. 5,666,020) in view of Itoh et al. (U.S. Patent No. 5,793,154). Applicant respectfully traverses this rejection.

The features of the cited references of Itoh and Takemura have been discussed above with reference to the prior rejections. The outstanding Office Action uses the Takemura reference to show that a field emitter display is known. Applicant respectfully submits that the suggested combination of references, whether taken alone or in any combination, fails to describe or suggest at least the combination of features of “...*at least one emitter having a platinum silicide coating embedded in the surface of the at least one emitter that releases electrons at a predetermined energy level, the platinum silicide coating decomposes at least one matter in the presence of outgassing to inhibit degradation of the at least one emitter, the outgassing including organic matters...*”, as recited in claim 8, as amended herein. The reasoning is similar to that given above with reference to the rejections of claims 5 and 7, specifically that the cited references disclose using the gate as a getter to prevent the emitter from being exposed to degradation and that it is not suggested that the emitter coating decomposes the outgassing material, and that the coating is embedded in the emitter surface.

In view of the about noted differences and deficiencies in the suggested combination of references, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claims 16 and 17 were rejected under 35 USC § 103(a) as being unpatentable over Itoh et al. in view of Kumar et al. (U.S. Patent No. 5,548,185) and Tjaden et al. (U.S. Patent No. 5,770,919). Applicant respectfully traverses this rejection.

The features of the cited references of Itoh and Kumar have been discussed above with reference to the previous rejections. The outstanding Office Action uses the cited Tjaden reference to show the missing feature of the light emitting target being coated with a luminescent or phosphorescent compound. Tjaden discloses a series resistor associated with each micropoint emitter to prevent over current situations (claim 1, and col. 3, line 65 to col. 4, line 6). Applicant respectfully submits that even if the suggested combination were allowable, the result would still not contain all of the features of the claims. Specifically, the suggested combination, whether taken alone or in any combination, still does not describe or suggest at least the claimed combination of features of “...*at least one emitter comprising silicon having a coating embedded in the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating acts in the presence of the outgassing to inhibit degradation of the at least one emitter...*”, as recited in base claim 15, as amended herein, from which dependent claims 16 and 17 depend.

The suggested combination of references does not contain all of the features of the base claim, specifically they disclose using the gate as a getter to prevent the emitter from being exposed to degradation and it is not described or suggested that the emitter coating decomposes the outgassing material, or that the coating is embedded in the emitter surface. Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claims 18-22 were rejected under 35 USC § 103(a) as being unpatentable over Hush (U.S. Patent No. 5,663,742) in view of Takemura. Applicant respectfully traverses this rejection.

The features of Takemura have been discussed above with reference to the prior rejections. The Hush reference discloses that every *n*th shift cell of the row register is left disconnected to reduce the number of rows of a field emission display (col. 2, lines 29-31), which reduces the number of rows in the array and improves yield and reduces the minimum dimension of the array.

The Takemura reference is used in the outstanding Office Action to show the missing feature of Hush of the emitter having a coating that releases electrons and is stable in the presence of outgassing. As discussed above, the cited reference of Takemura discloses an emitter having the top portion of the emitter tip having the highest resistance (col. 4, lines 45-48 and col.

5, lines 13-16). Takemura discloses that it is preferred that the emitter has resistance that simply increases in a direction toward the top of the emitter.

Applicant submits that the suggested combination of references fails to describe or suggest at least the combination of features of “...*at least one emitter having a coating embedded in the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating is stable in the presence of the outgassing ...*”, as recited in independent claim 18, as amended herein, from which the other claims depend. Thus the suggested structure of the combination of references is different than the claimed structure, and the suggested combination of references still does not contain all of the claimed features of claims 18-22. Applicant submits that the suggested combination of references is inappropriate and requests that the rejection be reconsidered and withdrawn.

Claims 23 and 24 were rejected under 35 USC § 103(a) as being unpatentable over Hush in view of Takemura and Haase et al. (U.S. Patent No. 5,684,358). Applicant respectfully traverses this rejection.

The features of Hush and Takemura have been discussed above. Haase is used in the Office Action to show the missing feature of a flat panel television display. Claims 23 and 24 depend from independent claim 18. Applicant respectfully submits that it has been shown above that independent claim 18 is patentable over the suggested combination of Hush in view of Takemura. In light of the above, Applicant respectfully submits that dependent claims 23 and 24 are patentable over the suggested combination at least as being dependent upon an allowable base claim. Applicant submits that the suggested combination of references fails to describe or suggest at least the combination of features of “...*at least one emitter having a coating embedded in the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating is stable in the presence of the outgassing ...*”, as recited in independent claim 18, as amended herein, from which claims 23 and 24 depend. The cited reference of Haase is not seen as curing the above noted deficiencies of the suggested combination of Hush and Takemura, and the suggested combination still does not result in all of the features of claims 23 and 24 taken with the features of base claim 18. Applicant therefore submits that the suggested combination of references is inappropriate and that the rejection should be withdrawn.

Applicant thanks the Examiner for the indication of allowable subject matter with regard to claim 26, and with regard to dependent claim 10, if the features of the base claim were included. Applicant has amended base claim 1 to include the allowable feature of dependent claim 10, which has been cancelled with out prejudice for waiver of patentable subject matter herein. Applicant respectfully submits that since the indicated patentable subject matter of the coating being embedded in the emitter has been added to the remaining claims, that claims 1- 8, 11- 24 and 26 are now in patentable condition, and requests that they be passed to issue.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney, David Suhl, at (508) 865-8211 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

BEHNAM MORADI ET AL.

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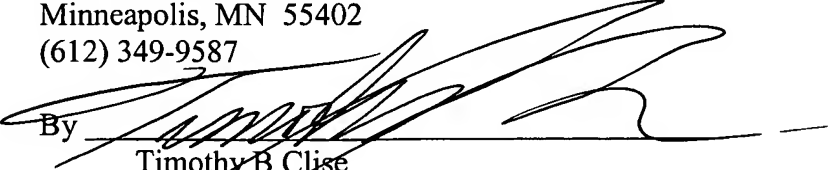
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